The Relationship among University Students' Interest in Horticulture, Psychological Well-Being and Social Development and the Influence of Measured Variables

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Abstract

The study was conducted to understand the relationship among university students' interest in horticulture, psychological well-being and social development and the influence of measured variables. In order to collect data, the surveys were executed by convenience sampling on university students attending four-year universities in Daegu and Gyeongbuk regions of South Korea during the period from July 3 to July 17, 2016. A total of 307 survey results which measured the university students' interest in horticulture, psychological well-being and social development were analyzed. The results showed that there are differences in the interest in horticulture, psychological well-being, and social development depending on the students' general characteristics. According to the results analyzed by t-test and one-way ANOVA, the interest in horticulture depending on gender, religion, academic marks, family life satisfaction and school life satisfaction had significant differences showing high interest for the students with religion, good academic marks, high family life satisfaction and school life satisfaction as well as female students. Psychological well-being showed significant differences in academic marks, family life satisfaction and school life satisfaction, while social development displayed significant differences in gender, grade, academic marks, family life satisfaction and school life satisfaction. According to the results analyzed by correlation analysis, there was a significant correlation among university students' interest in horticulture, psychological well-being and social development. Furthermore, regression analysis verified that university students' interest in horticulture has a positive influence on psychological well-being and social development. The results of this study implies that university students with a higher interest in horticulture have higher levels of psychological well-being and social development.

Key words : *interest in horticulture, psychological well-being, social development*

I. Introduction

Horticultural activity is a specialized activity seeking rehabilitation and recovery of the body and soul as well as quality of life (Matsuo and Relf, 1995; Jung, 2011a). Emotional experience of horticultural activity can increase the desire for living and self-esteem and decrease self-anxiety, and is effective in cultivating emotional intelligence and improving interpersonal relations and sociality (Jeung et al., 2001; Cho et al., 2003; Jung, 2011b; Jung et al., 2014).

Thus far, studies that covered the relationship between horticultural activity and psychological variables have been conducted in multiple aspects, but most of them are on children

or adolescents in secondary school, without many related research on university students. For example, the result of searching articles with 'horticultural activity' as the keyword on the Research Information Service System (RISS) showed that there were only 2 out of 450 graduate theses and 4 out of 579 articles of academic journals in Korea were on university students. In addition, search results on the RISS also show that there is an extreme lack of similar research that investigated the correlation and influence of the relationship among interest in horticultural activity, psychological well-being and social development. Meanwhile, university students that belong to the late adolescence and early adulthood in terms of development must achieve the basic developmental tasks like establishment of ego identity and maturity in character, while also facing the psychological burden of adjusting to the changes in the social environment. This may lead to stress, which can

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result in physical discomfort and psychological problems (Kim, 2014). Therefore, this study is anticipated to help establish and implement a program for emotional stability, recovery of mental health and improved quality of life through horticultural activity by investigating the relationship among horticultural activity, psychological well-being and social development and influence of variables targeting university students exposed to psychological and emotional anxiety or stress.

II. Research method

1. Research subjects

To collect data, surveys were conducted by convenience sampling on university students attending four-year universities in Daegu and Gyeongbuk from July 3 to 17, 2016. 320 effective copies of the sample out of 350 copies distributed were collected, showing a 91.4% recovery rate. Total 307

Table 1. General characteristics of the respondents ($N=307$).

Division		Frequency (Percent)
Gender	Male	162 (52.8)
	Female	145 (47.2)
Grade	First	61 (19.9)
	Second	92 (30.0)
	Junior	63 (20.5)
	Senior	91 (29.6)
Major	Society of humanity	150 (48.9)
	Natural science	60 (19.5)
	Education	28 (9.1)
	Engineering	36 (11.7)
	Art and music	33 (10.7)
Religion	Have	204 (66.4)
	None	103 (33.6)
Academic	High	97 (31.6)
Marks	Average	169 (55.0)
	Low	41 (13.4)
Family	Satisfied	222 (72.3)
Life	So so	75 (24.4)
Satisfaction	Unsatisfied	10 (3.3)
School	Satisfied	172 (56.1)
Life	So so	110 (35.8)
Satisfaction	Unsatisfied	25 (8.1)

copies of the questionnaire were used in the final analysis, excluding 13 copies with issues such as non-response or lack of consistency. Table 1 shows the general characteristics of the subjects.

2. Measurement tools

The measurement tools used in this study are the interest in horticultural activity scale, psychological well-being scale, and social development scale. The following shows the formation of the scales and the reliability of the scales consisting of multiple items.

1) Interest in horticultural activity scale

The interest in horticultural activity scale in this study was the questionnaire organized by Kim (2009) and modified, improved and standardized by Jung (2011b). This scale consists of total 13 items in 3 sub-factors, such as affective interest (5 items), cognitive interest (5 items), and psychological interest (3 items). Each item was rated on a five-point Likert scale ranging from 1 point (strongly disagree) to 5 points (strongly agree), with higher scores indicating higher interest in horticultural activity. In the study by Jung (2011b), the total Chronbach's α of interest in horticultural activity was 0.89, while that in this study was 0.87. Table 2 shows the content and reliability of interest in horticultural activity.

2) Psychological well-being scale

To measure psychological well-being, this study used the Psychological Well-Being Scale (PWBS) developed by Ryff (1989) and modified and validated by Kim et al. (2001). This scale consists of total 46 items in 6 sub-factors, such as self-acceptance (8 items), environmental mastery (8 items), positive relations (7 items), autonomy (8 items), personal

Table 2. Content and reliability of interest of horticultural activity ($N=307$).

Sub factors	Item questions number	Item numbers	Chronbach's α
Affective interest	8, 9, 10, 11, 12	5	0.75
Cognitive interest	1, 2, 3, 5, 13	5	0.71
Psychological interest	4, 6, 7	3	0.77
Total		13	0.87

Table 3. Content and reliability of psychological well-being ($N=307$).

Sub factors	Item questions number	Item numbers	Chronbach's α
Self acceptance	3, 8, 12*, 19, 24, 26*, 39, 42	8	0.78
Environmental mastery	1, 6*, 14, 16*, 25, 30, 40*, 44	8	0.76
Positive relations	4*, 9*, 13, 20*, 27*, 38, 46*	7	0.79
Autonomy	5, 10, 15, 21*, 29, 33*, 36*, 43	8	0.74
Personal growth	2*, 17, 22*, 31, 34*, 37, 41*, 45*	8	0.74
Purpose in life	7*, 11*, 18*, 23*, 28, 32, 35	7	0.77
Total		46	0.91

*Recoding questions.

growth (8 items), and purpose in life (7 items), and 24 of them are rated in normal direction and 22 of them in reverse direction as recoding questions. Each item was rated on a five-point Likert scale ranging from 1 point (strongly disagree) to 5 points (strongly agree), with higher scores indicating higher psychological well-being.

In the study by Kim et al. (2001), the total Chronbach's α of psychological well-being was 0.89, while that in this study was 0.91. Table 3 shows the content and reliability of psychological well-being.

3) Social development scale

To measure social development, this study used the questionnaire created by Jung (1971), standardized by Han (1998) and adopted by Choi (2004) and Park (2005). This scale consists of total 25 items in 5 sub-factors, such as activity (5 items), stability (5 items), dominance (5 items), sociality (5 items), and autonomy (5 items), and 20 of them are rated in normal direction and 5 of them in reverse direction as recoding

questions. Each item was rated on a five-point Likert scale ranging from 1 point (strongly disagree) to 5 points (strongly agree), with higher scores indicating higher social development. In the study by Choi (2004), the total Chronbach's α of social development was 0.70, while that in this study was 0.87. Table 4 shows the content and reliability of social development.

3. Data analysis

Data measured in this study are analyzed and processed as follows using IBM SPSS 22.0 (IBM Corp., Armonk, NY, USA).

First, reliability of the scales used in this study was verified by calculating Chronbach's α through internal consistency analysis. Second, t-test and one-way ANOVA were conducted to determine the differences of interest in horticultural activity, psychological well-being and social development according to the general characteristics of the subjects. Third, correlation analysis and regression analysis were conducted to measure the relationship and influence among interest in horticulture, interest in horticultural activity, psychological well-being and social development.

III. Results

1. Differences of interest in horticultural activity, psychological well-being, and social development according to the general characteristics of the subjects

1) Differences of interest in horticultural activity according to the general characteristics of the subjects

To determine the interest in horticultural activity according

Table 4. Content and reliability of sociality development ($N=307$).

Sub factors	Item questions number	Item numbers	Chronbach's α
Activity	1, 2, 3*, 4, 5	5	0.74
Stability	6*, 7*, 8, 9, 10	5	0.79
Dominance	11, 12, 13, 14, 15	5	0.71
Sociality	16*, 17, 18, 19, 20	5	0.87
Autonomy	21, 22, 23, 24*, 25*	5	0.78
Total		25	0.87

*Recoding questions.

to the general characteristics of the subjects, t-test was conducted for gender and religion, and one-way ANOVA was conducted for grade, major, academic marks, family life satisfaction and school life satisfaction. The results showed that interest in horticultural activity had no difference according to grade ($F=0.668$, $p=.572$) and major ($F=1.656$, $p=.160$). On the other hand, interest in horticultural activity showed a significant difference according to gender, religion, academic marks, family life satisfaction and school life satisfaction. For example, it was verified that female students ($M=3.65$) had higher interest in horticultural activity than male students ($M=3.46$) ($t=-3.284$, $p=.001$). Students without a religion ($M=3.39$) also had higher interest in horticultural activity than students with a religion ($M=3.62$) ($t=3.775$, $p=.000$). Students with top academic marks ($M=3.65$) had higher interest in

horticultural activity than those with middle ($M=3.49$) and low academic marks ($M=3.51$) ($F=3.139$, $p=.045$). For family life satisfaction, students who were satisfied ($M=3.60$) showed higher interest in horticultural activity than neutral ($M=3.41$) or unsatisfied ($M=3.42$) ($F=3.959$, $p=.020$). For school life satisfaction, students who were satisfied ($M=3.62$) also showed higher interest in horticultural activity than neutral ($M=3.47$) or unsatisfied ($M=3.37$) ($F=4.559$, $p=.011$) (Table 5).

2) Differences of psychological well-being according to the general characteristics of the subjects

As a result of determining the differences of psychological well-being according to the general characteristics of the subjects, it was found that there was no difference in psychological well-being according to gender ($t=.846$, $p=.398$), grade ($F=.436$,

Table 5. Difference of interest of horticultural activity according to the general characteristics.

Division		Mean (SD)	F / t
Gender	Male	3.46 (0.48)	-3.284**
	Female	3.65 (0.54)	
Grade	First	3.56 (0.48)	.668
	Second	3.56 (0.55)	
	Junior	3.60 (0.49)	
	Senior	3.49 (0.53)	
Major	Society of humanity	3.52 (0.46)	1.656
	Natural science	3.62 (0.53)	
	Education	3.63 (0.51)	
	Engineering	3.38 (0.68)	
	Art and music	3.63 (0.52)	
Religion	Have	3.62 (0.47)	3.775***
	None	3.39 (0.57)	
Academic Marks	High	3.65 (0.55)	3.139*
	Average	3.49 (0.51)	
	Low	3.51 (0.45)	
Family Life Satisfaction	Satisfied	3.60 (0.52)	3.959*
	So so	3.41 (0.47)	
	Unsatisfied	3.42 (0.72)	
School Life Satisfaction	Satisfied	3.62 (0.52)	4.559*
	So so	3.47 (0.49)	
	Unsatisfied	3.37 (0.56)	

Significant at * $p<.05$, ** $p<.01$, *** $p<.001$ by t-test and one-way ANOVA.

Table 6. Difference of psychological well-being according to the general characteristics.

Division		Mean (SD)	F / t
Gender	Male	3.38 (0.44)	.846
	Female	3.34 (0.35)	
Grade	First	3.33 (0.36)	.436
	Second	3.38 (0.45)	
	Junior	3.33 (0.34)	
	Senior	3.39 (0.41)	
Major	Society of humanity	3.35 (0.44)	.352
	Natural science	3.34 (0.33)	
	Education	3.42 (0.33)	
	Engineering	3.38 (0.37)	
	Art and music	3.40 (0.42)	
Religion	Have	3.39 (0.38)	1.402
	None	3.32 (0.42)	
Academic Marks	High	3.53 (0.37)	14.443***
	Average	3.29 (0.39)	
	Low	3.26 (0.39)	
Family Life Satisfaction	Satisfied	3.42 (0.38)	9.971***
	So so	3.19 (0.35)	
	Unsatisfied	3.34 (0.71)	
School Life Satisfaction	Satisfied	3.50 (0.35)	28.421***
	So so	3.22 (0.36)	
	Unsatisfied	3.07 (0.48)	

Significant at * $p<.05$, ** $p<.01$, *** $p<.001$ by t-test and one-way ANOVA.

$p=.727$), major ($F=.352, p=.843$) and religion ($t=1.402, p=.162$). On the other hand, psychological well-being showed a significant difference according to academic marks, family life satisfaction and school life satisfaction. For example, it was verified that students with top academic marks ($M=3.53$) had higher psychological well-being than those with middle ($M=3.29$) and low academic marks ($M=3.26$) ($F=14.443, p=.000$). For family life satisfaction, students who were satisfied ($M=3.42$) showed higher psychological well-being than neutral ($M=3.19$) or unsatisfied ($M=3.34$) ($F=9.971, p=.000$). For school life satisfaction, students who were satisfied ($M=3.50$) also showed higher psychological well-being than neutral ($M=3.22$) or unsatisfied ($M=3.07$) ($F=28.421, p=.000$) (Table 6).

3) Differences of social development according to the general characteristics of the subjects

As a result of determining the differences of social development according to the general characteristics of the subjects, it was found that there was no difference in social development according to grade ($F=.171, p=.916$), major ($F=.367, p=.832$) and religion ($t=.654, p=.514$). On the other hand, social development showed a significant difference according to gender, academic marks, family life satisfaction and school life satisfaction. For example, it was verified that male students ($M=3.28$) had higher social development than female students ($M=3.16$) ($t=2.449, p=.015$). Students with top academic marks ($M=3.37$) had higher social development than those with middle ($M=3.16$) and low academic marks ($M=3.13$) ($F=8.472, p=.000$). For family life satisfaction, students who were satisfied ($M=3.26$) showed higher social development than neutral ($M=3.11$) or unsatisfied ($M=3.25$) ($F=3.354, p=.036$). For school life satisfaction, students who were satisfied ($M=3.32$) also showed higher social development than neutral ($M=3.10$) or unsatisfied ($M=3.07$) ($F=10.997, p=.000$) (Table 7).

2. Correlation among measurement variables

Correlation analysis was conducted to determine the correlation among interest in horticultural activity, psychological well-being and social development of the subjects. The results showed that interest in horticultural activity of university students had a statistically significant positive correlation with

Table 7. Difference of sociality development according to the general characteristics.

Division		Mean (SD)	F / t
Gender	Male	3.28 (0.44)	2.449*
	Female	3.16 (0.42)	
Grade	First	3.24 (0.46)	.171
	Second	3.23 (0.41)	
	Junior	3.24 (0.44)	
	Senior	3.20 (0.44)	
Major	Society of humanity	3.21 (0.47)	.367
	Natural science	3.28 (0.39)	
	Education	3.23 (0.45)	
	Engineering	3.22 (0.36)	
	Art and music	3.20 (0.45)	
Religion	Have	3.24 (0.42)	.654
	None	3.20 (0.48)	
Academic Marks	High	3.37 (0.42)	8.472***
	Average	3.16 (0.44)	
	Low	3.13 (0.38)	
Family Life Satisfaction	Satisfied	3.26 (0.42)	3.354*
	So so	3.11 (0.46)	
	Unsatisfied	3.25 (0.52)	
School Life Satisfaction	Satisfied	3.32 (0.40)	10.997***
	So so	3.10 (0.44)	
	Unsatisfied	3.07 (0.51)	

Significant at * $p<.05$, ** $p<.01$, *** $p<.001$ by t-test and one-way ANOVA.

Table 8. Results of correlation analysis between measurement variables.

Measurement variables	1	2	3
1. Interest of horticultural activity	1		
2. Psychological well-being	.206***	1	
3. Sociality development	.185**	.625***	1

Significant at * $p<.05$, ** $p<.01$, *** $p<.001$ by Pearson correlation analysis.

psychological well-being ($r=.206, p=.000$) and social development ($r=.185, p=.001$). There was also a statistically significant correlation ($r=.625, p=.000$) between psychological well-being and social development (Table 8).

3. Influence among measurement variables

Simple regression analysis was conducted to determine

Table 9. Results of regression analysis between measurement variables.

Independent variables	Dependent variables	β	SE	t	p	Statistics
Interest of horticultural activity	Psychological well-being	.206	.043	3.668	.000***	$R^2=.042$ Adjusted $R^2=.039$ F=13.455 (.000)
Interest of horticultural activity	Sociality development	.185	.047	3.288	.001**	$R^2=.034$ Adjusted $R^2=.031$ F=10.809 (.000)

Significant at * $p<.05$, ** $p<.01$, *** $p<.001$ by simple regression analysis.

the mutual influence among interest in horticultural activity, psychological well-being and social development of the subjects. The results showed that interest in horticultural activity had a statistically significant positive influence on psychological well-being ($\beta=.206$, $t=3.668$, $p=.000$) and social development ($\beta=.185$, $t=3.288$, $p=.001$). This proved that higher interest in horticultural activity of university students indicated higher psychological well-being and social development (Table 9).

IV. Discussions

This study was conducted to investigate the relationship among interest in horticultural activity, psychological well-being and social development of university students as well as influence among variables. The results showed that interest in horticultural activity, psychological well-being and social development had differences according to the general characteristics of the subjects.

First, the analysis of the differences in interest in horticultural activity according to the general characteristics showed that there were significant differences in gender, religion, academic marks, family life satisfaction, and school life satisfaction. This study proved that female students had higher interest in horticultural activity than male students, which is consistent with the study results by Park et al. (2006) who conducted a survey to determine the general knowledge and interest of apartment residents in indoor plants and discovered that women (72.6%) tended to use plants 3 times more than men (27.4%). Moreover, the results were also in line with the study by Choi (2007) who proved that horticultural activity had a positive effect on the overall school life satisfaction, and this study also showed that students with high satisfaction in family life or school life also had high interest in horticultural activity.

The analysis of the differences in psychological well-being according to the general characteristics showed that there were

significant differences in academic marks, family life satisfaction, and school life satisfaction (Table 6). Nho and Kim (2012) also stated that academic stress, academic marks and school life satisfaction had a positive effect on self-esteem and psychological well-being of adolescents. As a result of analyzing the differences in social development according to the general characteristics, it was found that there were significant differences in gender, academic marks, family life satisfaction and school life satisfaction (Table 7). Kim et al. (2013) stated that male students in middle school had higher perception of leisure to form positive sociality than female students, and this study also showed that male students had higher social development. Lee et al. (2012) only studied female university students, but proved that sociality had a positive effect on satisfaction in university life, and this study also showed that students with high school life satisfaction also had higher social development.

As a result of conducting the correlation analysis to determine the correlation among interest in horticultural activity, psychological well-being and social development, it was found that interest in horticultural activity of university students showed a statistically significant positive correlation with psychological well-being and social development (Table 8). This is in line with the results that psychological well-being of female students attending an academic high school increased significantly after horticultural activity (Ha, 2013), and that horticultural activity vitalizes helpless life by providing an opportunity of communication among the subjects and improving personal relations (Cho, 2003). This study also examined the influence among measurement variables, and it was verified that interest in horticultural activity had a positive influence on psychological well-being and social development, which suggested that higher interest in horticultural activity of university students indicated higher level of psychological well-being and social development as well (Table 9). Such results are consistent with the study by Jung et al. (2014)

proving that interest in horticultural activity had a positive effect on social development, and the study by Ha (2012) showing that a horticultural activity program has a positive effect on psychological well-being. This study aimed to establish the foundation for more expanded research by examining the relationship among interest in horticultural activity, psychological well-being and social development and influence among the variables, and by accurately clarifying the variables related to horticultural activity as well as influential variables that had not been sufficiently studied thus far. However, this study failed to clarify the relationship and influence among measurement variables in clear and multiple aspects. Therefore, follow-up research must be conducted more systematically and in-depth for more extensive and accurate clarification of measurement variables.

V. Conclusion

This study was conducted to determine the relationship among interest in horticultural activity, psychological well-being and social development of university students as well as influence among the variables. To collect data, surveys were conducted by convenience sampling on university students attending four-year universities in Daegu and Gyeongbuk from July 3 to 17, 2016. Total 307 copies of the questionnaire were used in the final analysis, measuring interest in horticultural activity, psychological well-being and social development.

The results showed that interest in horticultural activity, psychological well-being and social development had differences according to the general characteristics of the subjects. As a result of conducting the t-test and one-way ANOVA, interest in horticultural activity showed significant differences according to gender, religion, academic marks, family life satisfaction and school life satisfaction. For example, for gender, interest in horticultural activity was higher in female students ($M=3.65$) than male students ($M=3.46$), and students with a religion ($M=3.62$) than students without a religion ($M=3.39$). Moreover, students with top academic marks ($M=3.65$) and students satisfied with home and school life ($M=3.60$) also had high interest in horticultural activity. Psychological well-being showed significant differences in academic marks, family life satisfaction and school life satisfaction, while social development

showed significant differences in gender, academic marks, family life satisfaction and school life satisfaction.

As a result of conducting the regression analysis, it was verified that interest in horticultural activity of university students had a positively significant influence on psychological well-being and social development. This suggested that higher interest in horticultural activity of university students indicated higher level of psychological well-being and social development as well.

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